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*Journal of the Society of Arts.*

FRIDAY, JANUARY 3, 1862.

## INTERNATIONAL EXHIBITION OF 1862.

The Council beg to announce that the Guarantee Deed is now lying at the Society's House for signature, and they will be much obliged if those gentlemen who have given in their names as Guarantors, as well as others interested in the Exhibition, will make it convenient to call there and attach their signatures to the Document. Signatures for sums amounting in the aggregate to £442,950, have been attached to the Deed.

## WEEKLY PROGRESS OF THE INTERNATIONAL EXHIBITION.

Every credit is due to Messrs. Kelk and Lucas, who are doing their work with a rapidity which English energy and English capital alone could ensure; and, with all this haste of execution, one can detect no want of solidity in workmanship, or accuracy in finish. Although the task they have undertaken is at least three times as great as that in 1851, there is now no doubt at all that the building will be in a much more advanced state for the reception of goods at a corresponding date than in the former International Exhibition. To show how far the division of labour is carried in a work of such magnitude, it may be stated, that during the past week above 2,600 men were employed in different parts of the building.

The best spot for judging of the progress of the works in their present condition is the garden of the Royal Horticultural Society, and from here it may be seen how rapid a progress is being made from day to day. The contractors and the Thames Iron Company are competitors in the erection of the two domes, and the time-race between them begins to be quite exciting. It will be remembered that Mr. Kelk took the western dome in hand six weeks after the eastern one was begun, and, profiting by the experience gained, his deputy, Mr. Ashton, has adopted a different mode of construction, together with a greater distribution of detail, and has already advanced so far that there is every probability of the two domes being completed nearly at the same time.

In the eastern dome, six out of the twelve ribs are completed, and are tied together by jointings at the top, which jointings form a small duodecagonal ring. When the whole is finished, this ring will be the base of a small room about thirteen feet square, and it has been suggested that it will be admirably adapted for the observation of

meteorological phenomena. The other six ribs only want the top joints.

In the western dome all the ribs are rising at the same time from their starting, and the ring for the summit is already at the top of the scaffold and awaiting the completion of the ribs. It will thus be seen that, comparatively speaking, this dome is further advanced than its fellow.

The southern courts may now be pronounced to be completed, with the exception of painting and decoration. The northern courts are also progressing. The upper story of the refreshment courts above the arcades of the Horticultural Gardens, are being pushed forward very quickly, so much so that already the principals of the roof at the eastern end are fixed. The English contractors for refreshments intend constructing ample cellars beneath the eastern arcades, in which, during the Exhibition, they will store the best sorts of British beer.

Considerable progress may be discerned in the eastern annexe. The ground is being levelled, and a large portion of the arcades is completed. It is not yet decided whether or not there shall be, at the end of the annexe, a third class refreshment room.

The roof over the grand staircase is fixed, and ready for the glaziers. The beams of the smaller staircases, in the centre of the building, are in their places, and preparations are being made to lay down the stairs themselves, so that, before long, visitors will have free access to the galleries.

Her Majesty's Commissioners and the Council of the Royal Horticultural Society have entered into arrangements, by which it is agreed that the price of a season ticket of free admission to both the Horticultural Gardens and the Exhibition, shall be five guineas.

Her Majesty's Commissioners are still engaged in receiving notices of acceptance by British Exhibitors of the space allotted to them. Against such allotments, it is understood that 2,500 appeals have been lodged, a number about 250 times as great as that in the Exhibition of 1851. Arrangements are also being made to secure for exhibition, in the nave and transepts, trophies of the productions of the most eminent British manufacturers.

## THE MACHINERY DEPARTMENT OF THE EXHIBITION OF 1862.

CLASSES 5, 7, 8, AND 10.

## No. I.

The business of the machinery department, in classes 5, 7, 8, and 10, is, perhaps, the most onerous of all the business of the classes into which the industrial products are to be distributed for Exhibition.

The supply of steam to work the numerous machines which are to be in motion, is to be furnished from a number of large double-flue boilers, 30 feet in length, of 50 nominal horse power each, to be supplied by Messrs. Hick

and Sons, of Bolton, sufficiently powerful to work the whole of the machinery in motion at once, without any necessity for stopping any portion of it, or of working parts of the machinery alternately. The disadvantage of an under-supply of steam in former exhibitions was strongly felt, and it has been the aim of Her Majesty's Commissioners, in this particular, to have an ample supply of steam for every demand, without restriction. The steam from the boilers, which is to be of 70 lbs. pressure per square inch, will be conveyed through large pipes down the passages of the western annex, which is to contain all the machinery in motion; the extent of steam pipe will be unprecedented in engineering practice. The annex is nearly 1,000 feet in length from north to south, and the boiler-house will be built at a distance of at least 100 feet from the north end, near the Kensington-road. There will be two lengths of pipe about 900 feet each, and a third and shorter length, which, with the junctions required, will amount to a total length of upwards of 2,500 feet, for the ramification of steam pressure throughout the annex. It is not intended by Her Majesty's Commissioners to erect steam engines specially for the services, but to make free use of the numerous and various steam engines which will be exhibited, the intending exhibitors of which generally are desirous to have them put in motion. The steam pipe will be provided with expansion-boxes at frequent intervals, to take up the unavoidable expansion and contraction of metal pipes subjected to heat and cold alternately, and they will be thickly clothed in felt, and bedded in ashes, sand, or other non-conducting substance, so as to prevent loss of heat by radiation and condensation of steam within the pipe. Such a provision, though essential and highly important, is by no means so difficult to mature as appears to have been assumed by certain writers for the press; indeed, the proportion of steam lost by condensation may be reduced to a very small fraction, by the expedient of superheating it before it leaves the boiler-house, and drain-cisterns will be provided at suitable spots for the reception and collection of the water precipitating within the pipes.

The exhaust steam, discharged from the numerous steam engines at work in the annex, will be intercepted by large return exhaust pipes, laid parallel to the steam pipes, and conducted back to the shaft or chimney attached to the boiler-house, into which it will be discharged. Thus, the whole operation of the steam, conducted to the steam engines and back again, will be conducted without noise or nuisance; and the spectacle which would otherwise be presented of numberless clouds of spent steam escaping from the various engines through the roof of the annex, according to the usual routine of workshops, will be wholly prevented. The exhaust pipe, like the steam pipe, will be fitted with expansion-joints and drain-cisterns.

The gross area of the western annex is little more than four acres, or about 180,000 square feet; of this area 16,000 square feet are to be set apart for branch refreshment rooms, about 70,000 square feet for the exhibition of foreign machinery, and about 90,000 square feet for the machinery of the United Kingdom. An additional area of 20,000 square feet will probably be reserved in the eastern annex for the exhibition of machinery.

#### HARDWARE IN THE EXHIBITION OF 1862.

The *Ironmonger* says:—

Exhibitors in the hardware centres are now manifesting considerable interest in the Exhibition of 1862, and great activity is being displayed in preparing specimens. Much disappointment prevails in consequence of the cutting down of the space asked for by the various local committees. On every hand there are murmurs and expostulations; and, notwithstanding the clever device of asking for more space than was really required, under the impression that more would be got than if just the necessary quantity required had been asked for, and also applying through the Royal

Commissioners instead of through the local committee, the result is the same. Only a given space was at the disposal of the Commissioners, and it could not be extended. The only question which, therefore, does arise is simply, have the Commissioners recognised fairly and truly the various important seats of manufactures; and have they apportioned the limited space at their command in proportion to the wants and requirements of each locality?

The various districts engaged in the production of articles in iron and general hardware, embraced in Articles 31 and 32, are loud in their complaints. Sheffield feels in such a fix that it has appointed six local commissioners to apportion out the space, in order to get rid of the difficulty, which is considered to be so great that "it would require almost miraculous powers so to arrange it as to meet the wants of the large number of intending exhibitors. The number of applicants for space in classes 31 and 32 (iron and general hardware, steel and cutlery) was 103, and the space applied for 14,591 feet, whereas the extent of floor space for distribution among them was only 2,000 feet, or scarcely one-eighth of what was required. The number of applicants in other classes was 23, and the space applied for 883 feet, and for them there were 410 feet, or nearly 50 per cent. The total number of applications for space, therefore, was 126, and the amount of space required 15,474 feet, whereas the amount of space allotted was 2,410 feet of floor space, and the same space vertically.

In 1851, Sheffield asked for 9,673 feet floor, and 3,518 of wall space, to accommodate 298 intending exhibitors. It eventually got 3,736 floor, and upwards of 2,900 wall, but the number of exhibitors was reduced to 146, or 26 in excess of the number of present applicants.

In Wolverhampton, on the occasion of the Exhibition of 1851, 40 exhibitors asked for 1,982 feet of floor and 506 feet of wall space. Finally 44 exhibitors secured 603 feet of floor and 1,850 feet of wall space. On the present occasion, 36 exhibitors ask for 3,000 feet of floor, and get 1,000 feet, or one-third. In the case of Wolverhampton, however, the difficulty will not be so great as it seems, inasmuch as one applicant who will not, it is expected, show, and whose "inventions" do not come under the denomination of hardwares, asks for an extent which is an unduly large portion of the total space; and inasmuch also as an exhibitor of hurdles, and the like, asks for another large portion. In the latter case little difficulty would be experienced in so arranging the applicant's wares, as that he may obtain all the space he needs, and yet the convenience of some other exhibitors rather facilitated than impeded.

Birmingham, in 1851, for 291 intending exhibitors, applied for 15,895 feet floor, and 6,267 feet wall space, and got about half that asked for, or 7,383 feet of floor and 8,737 feet of wall space for 258 exhibitors. For the next Exhibition there is an increase of applicants for space, or 310 exhibitors, 85 of whom have been taken to be dealt with by the metropolitan committees. To the 225 applicants, who claim 19,330 feet of floor, and 7,271 feet of wall space, equal to 26,601 feet, the Commissioners have granted 5,572 feet of floor, and the same amount of wall space, in all, equal to 11,144 feet.

It is said, on the authority of the Royal Commissioners, that the total demand for floor space is seven times the quantity of that available. That being the case, the awards of space of floor do not appear liable to dispute, and, admitting that the duties are arduous which the local committees have had to perform, their hands have been strengthened by a most judicious letter which has been issued by the Royal Commissioners, and which is full of information, alike to local committees and exhibitors. In that letter, exhibitors are encouraged to endeavour to pile their goods, in the official words, by the "construction of screens or vertical cases, rising above the counters, or objects arranged on the floor. These screens, throughout the building, may be at least 12 feet high, and in some cases 25 feet, or even higher." Very few general hardwares, however, can be so treated, and the exhibiting of them prove of advantage to the exhibitor. "For articles

which will be suspended over head (not on walls) there is, practically, an unlimited space at the disposal of the Commissioners. Of this mode of exhibition, too, hardware manufacturers will, generally, be unable to avail themselves.

The six commissioners in Sheffield, and the local committees in Birmingham, has been busy in doing the best they could to meet the fair requests of all, and in particular negotiating with large applicants, in order to induce them to help others who really need all the space they have asked for, and whose representations will be really insufficient without it. All are seemingly uniting to render the representation of the manufactures of their respective towns and districts worthy of the positions which they so earnestly worked for, and successfully achieved in the Great Exhibition of 1851.

Steps are being taken in Wolverhampton which are likely to revive the great lock controversy of ten years ago. There is now in course of manufacture in that town a new patent keyless lock, having 244,140,125 combinations, to open all of which would take a man—supposing he could live so long—some 130 years! This extraordinary lock, which is based upon the permutation principle, is the invention of Viscount de Kersolon, of Paris, and by him communicated to Mr. Edward Loysel, of Cannon-street, London, who is better known as the patentee of the coffee percolator. Although it is termed a keyless lock, it has as many keys as there are combinations, the back parts being the locks and the front parts the keys, which cannot be removed. Every change made in the concentric rings answers the same purpose as the keys, so that a lock which has seven permutations, or 5,040 combinations, has 5,040 keys, and so it is termed a keyless lock, with 5,040 or any number of keys. The specimen has six concentric cylinders, upon the projecting or outer edges of which are twenty-five of the twenty-six letters of the alphabet, and it is only when these letters are brought into a certain predetermined arrangement that the other parts of the lock can be so worked as to admit of the bolt being drawn for the purpose of shutting or opening the article to which the lock is applied. It is absolutely necessary, as in the old letter padlock, to know the proper arrangement or combination of letters before the lock can be opened. In order to prevent the particular combination of letters from being discovered by feeling the parts, as is sometimes the case, the inner edges of the moveable concentric cylinders are toothed or serrated, so as to deceive any person who may attempt to tamper with the lock. In the event of the particular combination of letters not being discovered by the person desirous of opening the lock, the exhausting of all the variations which are in that case necessary to the success of the operation would entail an expenditure of the time we have mentioned, supposing the operator to make ten changes a minute, and to manipulate ten hours on every working day. It is intended to place these locks on some iron safes that are also being made in Wolverhampton for exhibition at the forthcoming "World's Fair." In one of the safes it is proposed to place the sum of £500, which is to fall to the lot of the person who may be fortunate enough to effect an opening into the safe. The production of the lock for the market is in the hands of Mr. Aubin, the inventor of the "Trophy lock of ingenuity," which was exhibited in the Hyde-park Palace, and subsequently purchased by Mr. Hobbs. Mr. Aubin, then a working locksmith, is now the proprietor of works in Wolverhampton, where he employs machinery invented by himself, and of equal delicacy with that displayed in the model which made his name celebrated. His ingenuity is being further displayed in the designing and constructing of machinery adapted to the manufacture just described. Mr. Aubin's practical experience also is being brought to bear in making such improvements upon the Count's lock as are required to increase the probability of its success in a financial aspect. The principle of the lock may be applied to every variety of this description of fastening, and when used upon a travelling-bag is a vast

improvement upon locks that require keys to open them, and is at the same time a great ornament.

#### THE EXHIBITION OF 1862 AND THE WORKING CLASSES.

A club has been formed at Sudbury, to enable the working population of that town to visit the Great International Exhibition of 1862. The club will receive deposits at the rate of not less than 3d. per week for a single ticket, and children under 12 years of age 2d. per week; and it is expected that not only will considerable resources be thus collected, but that great advantages will also be derived in regard to railway fares and accommodation in town from the principle of organisation. The mayor (Mr. S. Higgs) has offered 1s. each to the first 200 *bonâ fide* working men who subscribe. A similar club has been formed at Stowmarket and one or two other points in the eastern counties.

#### INTERNATIONAL CATTLE SHOW, 1862.

The Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland have jointly arranged to conduct an International Cattle Show in London next summer, and Battersea-park has been granted for the purpose, where the necessary enclosure and buildings will be made. The show will take place during the week commencing the 23rd of June, 1862. The prizes by the Royal Agricultural Society are offered in the following classes, and consist of money and medals:—

**CATTLE.**—Short-horned, Hereford, Devon (a gold medal will be given to the owners of the best male and the best female animals in the foregoing classes), Sussex, Long-horned, Norfolk and Suffolk polled, North Wales, South Wales, Irish—Kerry), Channel Islands—Jersey, commonly called Alderney, Guernsey.

**HORSES.**—Thoroughbred stud-horse, hunter, carriage, roadster.

**AGRICULTURAL HORSES.**—Suffolk, agricultural not qualified to compete as Suffolk, dray, ponies above 12½ and under 14 hands, and not exceeding 12½ hands.

**SHEEP.**—Leicester (a gold medal will be given to the owner of the best ram of any age in the class), Lincoln, Cotswold, Kentish or Romney Marsh, long-woolled (not qualified to compete as Leicesters, Lincolns, Cotswolds, or Kentish), Irish (pure native long-woolled breeds), South-down (a gold medal will be given to the owner of the best ram of any age in the class), Shropshire, Hampshire and West-country-down, Oxfordshire-down, Dorset, mountain.

**Pigs.**

The prizes by the Highland and Agricultural Society of Scotland are offered in the following classes, and consist of money and silver medals:—

**CATTLE.**—Polled (Aberdeen and Angus), polled (Galloway), Highland, Ayrshire.

**HORSES.**—Clydesdale.

**SHEEP.**—Black-faced, Cheviot.

Members of the Royal Agricultural Society of England, and of the Highland and Agricultural Society of Scotland, have the privilege of making entries, on the payment of 5s. on each certificate of cattle, horses, sheep, and pigs; but non-members will be allowed to compete on the payment of 15s. on each certificate.

Forms of certificate may be obtained on application to the Secretary, at the office of the Society, No. 12, Hanover-square, London, W. All certificates for the entry of live-stock must be returned, filled up, to the Secretary, on or before the 1st of May, and the Council have ordered that all certificates for live-stock received after the 1st of May shall not be accepted, but returned to the persons sending them.

All prizes of the Royal Agricultural Society of England, and all the prizes offered by the Highland and Agricultural Society of Scotland, are open to general competition.

As the object in giving prizes for neat cattle, sheep, and pigs, is to promote improvement in breeding stock, the judges, in making their awards, will be instructed not to take into their consideration the present value to the butcher of animals exhibited, but to decide according to the relative merits for the purpose of breeding. If, in the opinion of the judges, there should be equality of merit, they will be instructed to make a special report to the Council, who will decide on the award. The judges will be instructed to withhold any prize if they are of opinion that there is not sufficient merit in any of the stock exhibited for such prize to justify an award; should, however, the question of disqualifying a whole class arise, the judge shall consult with the Stewards of the yard, and their joint decision shall be final.

The judges will be instructed to give in a "reserved number" in each class of live-stock; viz., which animal would, in their opinion, possess sufficient merit for the prize in case the animal to which the prize is awarded should subsequently become disqualified. In the classes for stallions, mares, and fillies, the judges, in awarding the prizes, will be instructed, in addition to symmetry, to take activity and strength into their consideration. The judges will be instructed to deliver to the Director their award, signed, and stating the numbers to which the prizes are adjudged before they leave the yard. The necessary printed forms of certificates may be obtained from the Secretary, by persons desirous of exhibiting live-stock; who are requested to state the distinctive reference number assigned to each class in the above general list, and also to state how many forms of certificates they desire to have sent to them. The Secretary will acknowledge, by return of post, the due receipt of all certificates received by him one week or more before the 1st of May, and the receipt of all others as soon afterwards as the pressure of business at that time will permit. The name and residence of the breeder of each animal entered for exhibition should be stated when known: or, when not known, circumstantial information given respecting the cause of failure in that item of the certificate. The age of each animal, calculated up to the 1st of July inclusively, must be stated in the certificate. In all cases the age of the animal is to be computed from the day of its birth, excepting in the case of horses, when the year only will be required. The same animal cannot be entered in two classes, either for the prizes of the Royal Agricultural Society of England, or of the Highland and Agricultural Society of Scotland; nor can any animal entered for competition in either of those two divisions be allowed to compete in any other division. In every certificate of live-stock, the exhibitor will be required to sign an engagement to forfeit and pay to the society the sum of £20, if the animal, or any of the animals (as the case may be) which he exhibits are, to his knowledge, suffering under any contagious or infectious disease.

No stock whatever will be admitted into the yard for exhibition unless the necessary certificate has been sent to the Secretary by the proper time. All stock entered for exhibition may be brought to the show-yard between the hours of eight in the morning and six in the afternoon of Monday, the 23rd of June, and must all be in the yard by 4 p.m. on Tuesday, the 24th of June; none will be admitted after the latter hour.

All stock must remain in the show-yard until after six o'clock in the afternoon of Wednesday, the 2nd of July, and as much longer as the Director may consider it necessary. No horse will be allowed to leave the show-yard during the whole period that the exhibition lasts. The Society will not, in any case, or under any circumstances, hold itself responsible for any loss, damage, or mis-delivery of live-stock or other articles exhibited at the Society's show. No animal which has won a first prize in any class, at a previous meeting of the Society, will be allowed to compete for a similar prize at the meeting in London. No animal that has been exhibited at a fat stock show shall compete for the prizes of the Society. Any prize may be with-

held when the judges are of opinion that there is not sufficient merit in the stock exhibited for such prize to justify an award. No animal can be removed from its place without being subject to a fine of £1, nor can it be taken out of the show-yard, without leave in writing from the Director or the Stewards of the cattle yard. Exhibitors will be charged £1 for each cow sent into the yard to supply milk for animals exhibited. In order to prevent the non-exhibition of animals which have been entered for the show, thus causing unnecessary preparations, expense, and the disarrangement of the show-yard, a fine of 10s. will be levied for each entry of stock not exhibited, unless a certificate under the hand of the exhibitor, or his authorised agent, be lodged with the Secretary of the Society, at least fourteen days before the day of exhibition, certifying that such non-exhibition is caused either by:— 1. The death of the animal or animals; or 2. Contagious or infectious disease (confirmed by the explanatory certificate of a veterinary surgeon). All persons who shall neglect to pay in due course the stated fines incurred for non-exhibition, shall be debarred from exhibiting at the future country meetings of the Society.

The stewards will be instructed to endeavour, if possible, to decide all protests that may be made against the awards of the judges at the metropolitan show, before the conclusion of the meeting; such protests must be delivered to the Stewards, at the Director's office, in the show-yard, before six o'clock on the Wednesday evening of the show week; and no protests will be subsequently received unless satisfactory reasons be assigned for the delay.

Foreigners are invited to compete, and the Royal Agricultural Society of England offer prizes for male and female breeding stocks in each of the following classes, and those consist of a gold, silver, and bronze medal in each class:—

**CATTLE.**—Charolaise, Garonnaise, Norman, De Salers, Pyrenean, Breton, other French breeds, Flemish, Dutch, Swiss, Spanish, other Foreign breeds, Indian or other native Colonial breeds.

In addition to the above prizes, six grand gold medals of honour will be distributed among the above classes, at the discretion of the stewards and judges.

**HORSES.**—Horses for heavy draught, of any pure foreign breed; agricultural horses, used for agricultural purposes generally.

In addition to the above prizes, two grand gold medals of honour will be distributed among the above classes, at the discretion of the stewards and judges.

**SHEEP.**—French merino, Spanish merino, Saxon merino, other pure merino, long-woolled foreign breeds, short-woolled foreign breeds (not qualified for the above classes), cross-bred merino, other mixed breeds.

In addition to the above prizes, two grand gold medals of honour will be distributed among the above classes, at the discretion of the stewards and judges.

**PIGS.**—Pure foreign breeds.

The prizes offered by the Royal Agricultural Society of England amount to £3,690, of which £800 is offered in medals to be competed for by foreigners. The Highland Society offers £735 in money and £250 in medals. No prizes are offered for implements, as that would be in some degree trenching on the Great Exhibition, where the best implements will be distinguished by medals.

The last day of entry is the 31st of March, 1862. The necessary printed forms of certificate and specification may be obtained from the Secretary, at No. 12, Hanover-square, London, W., by persons who are desirous of exhibiting implements, &c., and no other implements, &c., will be admitted for exhibition unless the necessary certificate, filled in on the printed form prescribed, complete, and signed by the exhibitor (or his agent) in the manner directed, has been delivered to the Secretary, or sent (postage free) directed to him, so as to reach No. 12, Hanover-square, on or before the 31st of March, 1862. The specifications, and any additional particulars of such implements, must be delivered on the 31st of March; but if such speci-

fications and necessary particulars required by the printed rules be neglected to be sent by that time, such implement, &c., as that informality affects will be disqualified for exhibition. The certificate must state the space each exhibitor wishes to occupy (the sheds being 20 feet wide), in order that the space may be apportioned among the various parties who make application. Exhibitors of implements, &c., will have to pay 2s. per foot run towards defraying the expense of erecting such quantity of shedding as the committee may allot, and 1s. per foot frontage in the machinery-in-motion yard; which amount must be remitted to the secretary on or before the 15th of April, 1862. Non-members wishing to exhibit implements, &c., are required to pay 5s. as an entrance fee to the Society. This amount (in addition to 2s. per foot run of shedding required) must be sent to the secretary, on or before the 15th of April; otherwise the entry will become void. A description of each article intended to be shown must be written on one side only of the specification form. It must detail the name and address (when they are known) of the inventor, the improver, and the manufacturer; it must also state the improvements (if any), peculiarities, &c., of each implement. The specification must state the lowest selling price of each article complete, and in good working order, and each exhibitor will be bound to execute all orders given to him in the show yard at the price stated in his specification, on pain, in case of failure of such engagement, of not being again allowed to exhibit at the meetings of the Society. If a prize or medal was awarded at a previous meeting of the Society, to any implement which is entered for exhibition at the metropolitan meeting, the specification must state whether it was a prize or medal, or both, and the date at which it was awarded; if a prize, the amount must be stated; but this must be confined to the prizes or medals of the Royal Agricultural Society of England alone. If any improvement has been made in the implement subsequently to that award, a description and drawing of the improvement must be furnished, if required. Exhibitors, in sending in the specifications of their different articles for publication in the catalogue, must confine themselves to stating, within the space of six lines of printed catalogue matter, such particulars only as are required by the regulations of the prize sheet, as the insertion of additional particulars beyond those six lines up to twelve (the utmost allowed) must be paid for by the exhibitors at the rate of two shillings a line, with a view to prevent any unnecessary enlargement of the catalogue. In order to prevent the non-exhibition of implements which have been entered for the show, thus causing unnecessary preparations, expense, and the disarrangement of the show-yard, a fine of 5s. on implements under £10 in value, and a fine of 10s. on implements of £10 and upwards in value, will be levied on each implement which shall not be exhibited, unless a certificate, under the hand of the exhibitor, or his agent, shall be lodged with the Secretary of the Society on or before the day of exhibition, detailing the causes of prevention. All machinery, implements, &c., intended for exhibition, must be brought to the show-yard, and be arranged in complete order, before five o'clock in the evening of Saturday, the 21st of June. No implement having upon it paint or varnish in a wet state will be allowed to enter the yard. If any exhibitor shall send machinery away from home so that it is not possible for it to arrive in time to be admitted into the yard, he shall forfeit the right to the reduced rate of railway transit. Exhibitors must apply at the Hon. Director's office, in the show, for the number tickets corresponding with the Society's Catalogue; and these tickets must be affixed to the respective articles by five o'clock in the evening. Locomotive and traction engines will not be allowed to move about any portion of the yard, except such as the stewards may select, under their written authority. All implements must be unpacked and arranged in each stand by the exhibitor, according to their numbers, and in the same direction as the numbers of the different

stands run, consecutively. No implements can be removed from the yard until six o'clock in the evening of the last day of the show. No fire will be allowed to be lighted in the body of the show yard for any implement. No exhibitor may light a fire under, or supply the boiler of his steam engine, until he has the authority of the Hon. Director, or Stewards, to do so; this authority will be given after an engineer, appointed by the Society, has examined the engine, and has certified that the engine is perfectly safe under a working pressure of 45 lbs. per square inch, and that the engine is supplied with the necessary gauges for showing the pressure of steam and quantity of water in the boiler. No engine which is used for the exhibitor's own purpose in exhibiting his machinery to the public, will be allowed to work under a pressure greater than 45 lbs. per square inch; and coke, or smokeless coal, only may be used.

**STEAM ENGINES.**—All engines must be fitted with a steam-indicator, in addition to the ordinary spring-balance.

The Society will not, in any case, hold itself responsible for any loss, damage, or mis-delivery of implements, or other articles exhibited at the Society's shows.

### SILKWORMS.

In consequence of the epidemic sometime since amongst silkworms in France, Lombardy, and other places in Europe, large numbers of silkworm eggs have been imported into these places from the Morea, Adrianople, Broussa, Persia, and China. The eggs from China are sent *via* San Francisco. A consignment of 1,800lbs. of these eggs—which would contain upwards of 860,000,000 in number—was expected at the above-named port a short time since. Silkworm eggs are worth about 13s. per lb. in China, and from two to three guineas per lb. in Europe. France yearly consumes the product of 64,000lbs. of silkworm eggs, and Lombardy the product of 140,000lbs.—*Californian Paper.*

### CERTIFICATED TEACHERS OF SCIENCE.

The following Statement of the Results of the Examination of Candidates for Teachers' Certificates in Science, held in November, 1861, under the Minute of the Committee of Council on Education of the 2nd June, 1859, will be useful to the Institutions in Union with the Society of Arts, as showing where competent teachers may be obtained:—

**SUBJECT I.—PRACTICAL PLANE, AND DESCRIPTIVE GEOMETRY, MECHANICAL AND MACHINE DRAWING, AND BUILDING CONSTRUCTION.**

*Subdivision 1.—Practical Plane, and Descriptive Geometry.*

**1ST GRADE CERTIFICATE.**

Raimbach, David, W., School of Art, Birmingham.  
Chadwick, John, Modern Free School, Macclesfield.

**2ND GRADE CERTIFICATE.**

Woodcock, Fred. W., St. Martin's School, Leicester.  
Mellor, James, Hollinwood, Manchester.

**3RD GRADE CERTIFICATE.**

Constable, John, Boys' School, Christleton, Chester.  
Four failed.

*Subdivision 2.—Mechanical and Machine Drawing.*

**1ST GRADE CERTIFICATE.**

Raimbach, David W., School of Art, Birmingham.  
Rowden, William, Trade School, Bristol.

**2ND GRADE CERTIFICATE.**

Constable, John, Trade School, Christleton, Chester.  
Mellor, James, Hollinwood, Manchester.  
One failed.

*Subdivision 3.—Building Construction.*

**1ST GRADE CERTIFICATE.**

Raimbach, David W., School of Art, Birmingham.  
Chadwick, John, Modern Free School, Macclesfield.

## 2ND GRADE CERTIFICATE.

Mellor, James, Hollinwood, Manchester.  
One failed.

## SUBJECT II.—MECHANICAL PHYSICS.

*Subdivision 1.—Theoretical Mechanics.*

## 1ST GRADE CERTIFICATE.

Rowden, William, Trade School, Bristol.

## 2ND GRADE CERTIFICATE.

Stockton, William, Navigation School, Poplar.  
Maver, David, Mechanics' Institute, Aberdeen.  
Wood, Charles S., School of Mines, Bristol.  
Stirrup, Thomas, Saint Mark's College, Chelsea.

## 3RD GRADE CERTIFICATE.

Meaden, Henry P., Haslingden.  
Coomber, Thomas, Trade School, Bristol.  
Greenstreet, William H., National School, Evesham.  
Scaping, Zebedee, Navigation School, Hull.  
One failed.

*Subdivision 2.—Applied Mechanics.*

## 2ND GRADE CERTIFICATE.

Rowden William, Trade School, Bristol.

## 3RD GRADE CERTIFICATE.

Dufty, John N., County School, Leicester.  
Stockton, William, Navigation School, Poplar.  
Two failed.

## SUBJECT III.—EXPERIMENTAL PHYSICS.

*Subdivision 1.—Acoustics, Light, and Heat.*

## 1ST GRADE CERTIFICATE.

Clement, Leonard, East Lancashire Union of Institutions, Burnley.  
Davis, Uriah J., Upton St. Leonards, near Gloucester.  
Meaden, Henry P., East Lancashire Union of Institutions, Haslingden.  
Abbott, Joseph, Collegiate Institution, Liverpool.  
Allott, James, National School, Ruabon, North Wales.  
Eardley, Francis, National Model School, Belfast.  
Hargreaves, John, National School, Goldsborough, Knaresborough.  
Wheeler, George Henry, National School, Middleton, near Manchester.

## 2ND GRADE CERTIFICATE.

Bartley, George C. T., Stoke Newington.  
Bithell, Richard, Kingsland British School, Stoke Newington-road, N.  
O'Neill, Charles, 92, Grosvenor-street, Manchester.  
Rowden, William, Trade School, Bristol.  
Hudson, Fearnside, 68, Corporation-street, Manchester.  
Douglas, John C., London Birkbeck School, Chancery-lane.  
Nicholson, William, Longwathby, Penrith.  
Burchill, Samuel H., Navigation School, Mercer-street, Shadwell.  
Briggs, James A., London Birkbeck School, Chancery-lane.  
Cattell, Thomas, National School, Cottesmore, Oakham.  
Trower, Richard, 50, West Hill-street, Brighton.  
Farncomb, E., Preparatory School, Greenwich.  
Shore, Thomas William, Church of England School, Churcham, near Gloucester.

## 3RD GRADE CERTIFICATE.

Turner, George, National School, Queenshead, Halifax.  
Mackrell, Isaac, Wesleyan Training College, Westminster.  
Patchett, Isaac, Queenshead Schools, Halifax.  
Bowen, Edward, 39, Hutchinson-street, West Derby-road, Liverpool.  
Brears, William, Tandridge School, Godstone, Surrey.

*Subdivision 2.—Magnetism and Electricity.*

## 1ST GRADE CERTIFICATE.

Allott, James, National School, Ruabon, North Wales.  
Abbott, Joseph, Collegiate Institution, Liverpool.  
Deverell, W. T., Buenos Ayres, South America.

## 2ND GRADE CERTIFICATE.

Bithell, Richard, Kingsland British School, Stoke Newington-road, N.  
Davis, Uriah J., Upton St. Leonards, Gloucester.  
Pearce, William, Maber-lodge, Portswood, Southampton.  
Eardley, Francis, National Model School, Belfast.  
Clement, Leonard, East Lancashire Union of Institutions, Burnley.  
Douglas, John C., London Birkbeck School, Chancery-lane.  
Jones, Thomas, Halton, Hastings.  
Shore, Thomas William, Church of England School, Churcham, near Gloucester.  
Goffin, Robert, Endowed School, Exton, Oakham.  
Cattell, Thomas, National School, Cottesmore, Oakham.  
Briggs, James A., London Birkbeck School, Chancery-lane.  
Patchett, Isaac, Queenshead Schools, Halifax.

## 3RD GRADE CERTIFICATE.

Bartley, George C. T., Stoke Newington.  
O'Neill, Charles, 92, Grosvenor-street, Manchester.  
Bowen, Edward, 39, Hutchinson-street, West Derby-road, Liverpool.  
Burchill, Samuel H., Navigation School, Mercer-street, Shadwell.  
Hudson, Fearnside, 68, Corporation-street, Manchester.  
Jackson, William, Hunsingore, near Wetherby.  
Five failed.

## SUBJECT IV.—CHEMISTRY.

*Subdivision 1.—Inorganic Chemistry.*

## 1ST GRADE CERTIFICATE.

Beesley, Thomas, 5, High-street, Banbury.  
Baldock, John Henry, 55, Saint James's-road, Holloway, N.  
Woodcock, Frederick W., St. Martin's School, Leicester.  
Hudson, Fearnside, 68, Corporation-street, Manchester.  
Mason, James, 100, Upper Thames-street, E.C.  
Bithell, Richard, British School, Kingsland, N.  
Wire, Alfred Philip, Training College, Battersea.  
Hotchkin, Tycho Edward, County National School, Leicester.

## 2ND GRADE CERTIFICATE.

Rowden, William, Trade School, Bristol.  
Atkins, Edward, Saint Martin's School, Leicester.  
Chalk, Frank, 3, Heasman-terrace, Victoria-park, N.E.  
Abbott, Joseph, Collegiate Institution, Liverpool.  
Ward, George, Mechanics' Institution, Leeds.  
Clough, James Cresswell, Grammar School, Dedham, Colchester.  
Wild, Robert, Saint Mark's College, Chelsea.  
Atkins, George, Knighton-street School, Leicester.  
Stockton, William, Navigation School, Poplar.  
Warner, William, Training College, Battersea.  
Mayer, John, Carlton-place Secular Schools, Glasgow.  
Samuelson, Newton, 7 and 9, Hackin's Hey, Liverpool.  
Orkney, Daniel C., Free Church School, Jamestown, Dumbartonshire.  
Coles, Ferdinand, 9, Walpole-street, Chelsea.  
Manser, William, Training College, Battersea.  
Patchett, Isaac, Queen's Head Schools, Halifax.  
Snelus, George James, Christ Church School, Macclesfield.  
Bownas, John, The Green, Calne, Wilts.  
Taylor, Charles, Training College, Battersea.  
Berriman, John, Training College, Battersea.  
Bocharoff, Alexis, 17, Elton-street, Lower Broughton, Manchester.  
Brown, Moses, Training College, Battersea.  
Gatehouse, James Wright, Training College, Battersea.

## 3RD GRADE CERTIFICATE.

- Crawley, Samuel, Saint Mark's College, Chelsea.  
 { Bentley, Buzi, Training College, Battersea.  
 { Trower, Richard, Saint Peter's School, Brighton.  
 Woollett, John, Saint Mark's College, Chelsea.  
 High, William R., Saint Mark's College, Chelsea.  
 Jones, Thomas, Halton, Hastings.  
 Swaine, James, Bridge-street, Frome, Somerset.  
 { Dixon, Frederick T., Saint Mark's College, Chelsea.  
 { Moore, Thomas, Trinity College, Battersea.  
 King, Thomas, County School, Leicester.  
 { Goffin, Robert, Endowed School, Exton, Oakham.  
 { Lloyd, William, Saint Mark's College, Chelsea.  
 Bright, William, 17, Bute-st., Cromwell-lane, Brompton.  
 Two failed.

*Subdivision 2.—Organic Chemistry.*

## 1ST GRADE CERTIFICATE.

- O'Neill, Charles, 92, Grosvenor-street, Manchester.  
 Beesley, Thomas, 5, High-street, Banbury.  
 Woodcock, Frederick W., Saint Martin's School, Leicester.

## 2ND GRADE CERTIFICATE.

- Hargreaves, John, National School, Goldsborough, Knaresborough.  
 { Atkins, Edward, Saint Martin's School, Leicester.  
 { Meaden, Henry P., East Lancashire Union of Institutions, Haslingden.  
 Abbott, Joseph, Collegiate Institution, Liverpool.

## 3RD GRADE CERTIFICATE.

- Atkins, George, Knighton-street School, Leicester.  
 Samuelson, Newton, 7 and 9, Hackin's Hey, Liverpool.  
 Hotchkin, Tycho E., County National School, Leicester.  
 { Baldock, John Henry, 55, St. James's-road, Holloway, N.  
 { Orkney, Daniel C., Free Church School, Jamestown, Dumbartonshire.  
 Mason, James, 100, Upper Thames-street, E.C.  
 King, Thomas, County School, Leicester.  
 Three failed.

## SUBJECT V.—GEOLOGY AND MINERALOGY.

*Subdivision 1.—Geology.*

## 1ST GRADE CERTIFICATE.

- Morton, George H., 7, London-road, Liverpool.  
 Jarman, George, Almondbury, Huddersfield.

## 2ND GRADE CERTIFICATE.

- Noble, John, Working Men's College, Halifax.  
 Spencer, James, 17, New-street, Charles Town, Halifax.  
 Fulton, Hugh, Trade School, Bristol.  
 Chadwick, John, Modern Free School, Macclesfield.  
 { Dowling, John, 24, Irish Town, Clonmel.  
 { Watkins, James, The College, Dulwich.

## 3RD GRADE CERTIFICATE.

- { Jones, Thomas, Halton, Hastings.  
 { Puckett, Joseph, 14, Goldington-street, St. Pancras-road, London.  
 One failed.

## SUBJECT VI.—NATURAL HISTORY.

*Subdivision 1.—Physiology.*

## 1ST GRADE CERTIFICATE.

- Beveridge, Robert, 2, Upper Kirkgate, Aberdeen.  
 Douglas, John C., London Birkbeck School, Chancery-lane, London.  
 Rüntz, James, Birkbeck School, Kingsland, London.  
 Pike, Robert W., Birkbeck School, Bethnal-green, London.  
 Birkenhead, Edward H., Mining School, Wigan.  
 Tindall, George, Grove-street, Huddersfield.  
 Mayer, John, Secular School, Carlton-place, Glasgow.

## 2ND GRADE CERTIFICATE.

- Howard, John, Lower Islington Public School, London.  
 O'Neil, Charles, Working Men's College, Salford.

- { Beale, John Hill, Science School, Banbury.  
 { Jones, Thomas, Halton, Hastings.  
 { Tate, Ralph, Science School, Belfast.

## 3RD GRADE CERTIFICATE.

- Swaine, James, Bridge-street, Frome, Somerset.  
 One failed.

*Subdivision 2.—Zoology.*

## 1ST GRADE CERTIFICATE.

- Beveridge, Robert, 2, Upper Kirkgate, Aberdeen.  
 Tate, Ralph, Science School, Belfast.  
 Birkenhead, Edward H., Mining School, Wigan.  
 Tindal, George, Grove-street, Huddersfield.

## 2ND GRADE CERTIFICATE.

- Howard, John, Lower Islington Public School, Islington.  
 Swaine, James, Bridge-street, Frome, Somerset.

## 3RD GRADE CERTIFICATE.

- Beale, John Hill, Science School, Banbury.

## SUBJECT VII.—BOTANY.

*Subdivision 1.—Vegetable Physiology and Economic Botany.*

## 1ST GRADE CERTIFICATE.

- Beveridge, Robert, School of Science and Art, Aberdeen.  
 Mayer, John, Secular School, Carlton-place, Glasgow.  
 Jarman, George, Central School, Almondbury.  
 { Dowling, John, Science Schools, Cork and Clonmel.  
 { Sharp, Charles J., 15A, Upper North-place, Gray's-inn-road.  
 Tate, Ralph, Science Classes, Belfast.

## 2ND GRADE CERTIFICATE.

- Bithell, Richard, Kingsland British School, Stoke Newington, N.  
 { Noble, John, Working Man's College, Halifax.  
 { Wheeler, George Henry, National School, Middleton.

## 3RD GRADE CERTIFICATE.

- McFarlane, Archibald, Hodge-lane, Salford.  
 Farncomb, E., Preparatory School, Greenwich.  
 One failed.

*Subdivision 2.—Systematic Botany.*

## 1ST GRADE CERTIFICATE.

- Beveridge, Robert, School of Science and Art, Aberdeen.  
 Tate, Ralph, Science Classes, Belfast.  
 Dowling, John, Science Schools, Cork and Clonmel.

## 3RD GRADE CERTIFICATE.

- McFarlane, Archibald, Hodge-lane, Salford.  
 One failed.

## AURIFEROUS ROCKS OF VICTORIA.

The area of the quartz-bearing rocks at Victoria, in Australia, is estimated at 25,000 square miles. The total area of the extent of land at present mined upon in that colony is 561 square miles. Thus 89,920 square acres have produced gold to the amount of £92,787,236, on an average of about £1,032 per acre, and there yet remains upwards of 15,000,000 acres almost everywhere intersected by quartz veins of greater or less thickness, which are as yet intact by the pick of the miner.

## THE GREAT MONT CENIS WORKS.

M. Sommeiller, who is directing in chief the great works connected with the perforation of Mont Cenis, in a letter, states that everything is proceeding satisfactorily. Hitherto the boring has been carried on at the south end, but in January or February vast machines will be set to work on the north side also. Progress is now being made at the rate of about seven feet a day, and this speed will be doubled by February; but it will take at least six years more to accomplish this extraordinary and almost super-human task.



## EXTRACTS FROM THE REPORTS OF H.B.M. CONSULS.

(Continued from page 90.)

**NITRATE OF SODA AT IQUIQUE (PERU).**—As Iquique is the centre of this trade, and to it its present importance is wholly to be attributed, it is thought to be advisable to convey in this report as much information as can be procured as to this article, and in order that such information shall be truthful, the writer has availed himself of the views of several Englishmen at present engaged in the trade.

About from six to fourteen leagues from the coast, and running parallel with it through the province, at an elevation of 3,300 feet or thereabout, is the Pampa of Taramugal. This plain or pampa was a sea lake, and the greater part is covered with salt along the western border; and generally not extending eastwards more than 500 yards from the verge of the old lake is found the "caleche" or "terra salitrosa," rough nitrate. Between the pampa and the coasts exist other old sea lakes, on the borders of which "caleche" is also found; but these deposits are of secondary import. The "caleche" is generally found in insulated masses, irregular in shape and thickness, which adds greatly to the expense of working. It is sometimes found with only a few inches of sand over it, but more frequently covered with a hard stone, consisting of sand indurated with salt; this is called "costra," the thickness of which varies from one to ten feet, but averages three feet. The "caleche" varies in thickness from one to nine feet, but in general runs from three to four feet; below this exists a soft sand, containing an abundance of crystals of glauberite and small quantities of borates of lime and soda. The strata consist of

1. Loose sand, a few inches thick.
2. Hard sand, indurated with salt, from one to ten feet thick.
3. "Caleche," from one to nine feet thick.
4. Soft sand, or cora.

The caleche varies in quality from nearly pure salt to 50 and 60 per cent. of nitrate, generally containing the following substances:—

Earthy matter.  
Nitrate of Soda.  
Chloride of Sodium.  
Sulphate of Soda.

Lime.  
And traces of Chloride of Magnesium, and  
Iodides and Bromides.

It is impossible to state the respective proportions, as they vary with every different sample. The method of extracting and refining nitrate of soda is as follows:—

When "caleche" is required, the barretero (miner) makes holes in the ground where he expects to find it. If successful, he fills up the holes with coarse gunpowder made on the spot (costing three-and-a-half dollars per quintal), regulating the charge in proportion to the thickness and hardness of the "costra" and the thickness of the caleche; the charge varies from one to eight quintals, and occasionally as much as fourteen quintals; when blasted the whole mass is turned over and mixed. He then proceeds to separate the "costra" and "cora" from the "caleche," throwing aside all the latter that he does not believe to contain more than ten or twelve per cent. of nitrate; it is then broken into smaller lumps, to be conveyed to the "paradas." A refinery of nitrate is called an "Oficina," and is generally placed in the centre of the calecheros or nitrate grounds, and consists of one or more paradas; a parada is a pair of round iron boilers, each holding from 70 to 300 gallons; these are placed together, in rough stone work, with a fire-place between them. At the parada, the acendrador breaks the lumps into pieces about the size of a fist, rejects the inferior pieces, so as to bring the whole to about 25 to 35 per cent. of nitrate. It is now thrown into the boilers with a quantity of water; after boiling some two or three hours,

the fondeador (boiler), continually stirring the mass, supposing that the caleche is by that time exhausted, throws out the ripio (refuse), adds more caleche and mother water; and, after boiling some two or three hours, a well saturated solution is obtained; it is then by hand baled into a deposit, from whence, as soon as the mud and salts are deposited, it is baled into shallow coolers, where it crystallizes. The mother water is then drawn off and the nitrate thrown out to dry. The paradas are charged twice a day, and the daily product is from fifteen to twenty quintals of nitrate, containing about 3 per cent. of impurities, chiefly common salt. The average cost of a quintal of nitrate is:—

Barretero, breaking out	. . .	12½ cents.
Acendrador, assorting	. . .	6½ "
Fondeador, boiling	. . .	12½ "
Powder for blasting	. . .	6½ "
Asses bringing the caleche to the paradas	. . .	3 "
20 lbs. coals at 1.50 dol. per quintal	. . .	30 "
Wear and tear of parada, reparations, and depreciations	. . .	29½ "
		1.00 dol.

This system of making nitrate is the same as was first adopted at the commencement of the trade, and unquestionably well adapted for that early period, having the advantage of being simple, easily understood and worked; yet it is still continued, and the whole system of labour arranged to it. It is almost impossible to conceive a system more rude and more wasteful; and although many exertions have been made during the past ten years without success to improve it, yet that want of success has been caused chiefly by the lack of skilled labour in the province; still there is no doubt that it will be superseded, in the course of a few years, by the more refined and complicated apparatus now being introduced. The theory of the process of refining nitrate is this:—"Caleche" consists of nitrate of soda, chloride of sodium (common salt), and earthy matter (the other substances present exist in such small quantities that they are overlooked), and as chloride of sodium is very little more soluble in boiling than in cold water, whilst nitrate of soda is comparatively insoluble in cold but very soluble in hot water, it is very evident that it is only required to add such quantities of "caleche" to boiling water to procure a strongly saturated solution; the earthy matter, being insoluble, is left with the excess of common salt in the boiler, or the deposit, before it is discharged into the coolers, where, as the liquid cools, it deposits the excess of nitrate of soda, the mother liquor retaining nearly all the salts in solution. Reverting to the customary process of refining, two systems are now being tried, which use steam; in the one (Gamboni's patent) the "caleche" is placed in an inverted semi-cone, with a perforated cover and bottom; through the side a jet of steam is introduced, mother water is thrown on the cover, and the refined nitrate falls through the bottom, and is at once conveyed to the coolers; in the other, steam is introduced to boil the solution, but both promise the same advantages—economy in the make and a superior article.

No sketch of the nitrate trade would be complete without some reference to the abuses. In the first it is badly based. The merchant makes advances to the salitreros, or officineros (makers), of money and goods, on the promise of receiving in return the product of the oficina. This advance frequently is used in paying off old debts, or in advances to the labourers. The merchant must still keep advancing barley for the troops, coals and provisions for the labourer, &c., or there will be no nitrate forthcoming. This system trenches heavily upon the merchant's resources, and occasionally leads to losses. The officineros, as a body (with some exceptions), are a reckless set of men, wasteful in their expenditure and careless of their promises. Their arrangements with their labourers are also bad, their principal ones, the barretero, acendrador, and fondeador,

being paid according to the product of the parada; recriminations are ever recurring, and not unfrequently leading to a closing of the works. Another thing must also be noticed—the great amount of adulteration that has taken place within the three past years. Rarely a cargo leaves that is less worse than 5 per cent., some even 7 to 10, and some samples assayed have shown as much as 30 to 50 per cent. of foreign matter. The adulteration is effected in two ways; in one, white “caleche” is ground and mixed with the refined nitrate; this is called green nitrate; the other, the powdered “caleche,” is mixed into the solution, and at once put into the coolers; this is dirty nitrate. This is in some measure protected by the present state of the trade. Merchants in England purchase from the importer, and get a deduction from him corresponding to the amount of foreign matter in the article; but as the general sales are made without any deduction, then the worst cargoes are the most profitable to the merchants.

The province has not been thoroughly surveyed; but enough “caleche” has been discovered to yield an increased supply for ages. In May, 1856, there were about 100 oficinas at work, with about 250 paradas, but the work is not constant; 240 days is a good year's work. The principal sales of this article are made in Valparaiso on the usual terms, viz., ore well sacked, not to contain less than 95 per cent. of nitrate placed in the ship's launch outside the surf. The price has been very fluctuating, commencing at 18 reals, rising to 20 reals, falling to 16 reals, and then in four months rising to 23 reals, but taking an average price of 19 reals; 936,719 quintals, with the exchange at 46 dollars, would give £426,402 5s. 10<sup>3</sup>d. The other salts found in the province are chloride of sodium, bichlorates of lime and soda, sulphates of lime and soda, magnesium alum, &c. Iodine exists with the nitrate, and throughout the calecheros traces of boric acid have been found in the water.

#### SPECIFICATIONS OF PATENTS.

The following is an extract from the Ninth Annual Report to the Council of the city of Manchester on the working of the public free libraries:—

The references to the Specifications of Patents for the year have amounted to 31,103, being an increase upon the preceding year of 1,862.

The following is a statement of the total number of reference to the Specifications from 1857 inclusive:—

	References.
Total number of references, 1856-57 .....	20,877
“ “ 1857-58 .....	27,856
“ “ 1858-59 .....	36,972
“ “ 1859-60 .....	29,241
“ “ 1860-61 .....	31,103
	146,049

Amongst the specifications inquired after, the following are given as examples:—

Subjects referred to.	No. of References.
Textile fabrics and processes connected therewith .....	10,086
Steam and steam engines .....	2,481
Gas manufacture .....	1,458
Railways and railway rolling stock .....	1,304
Sewing machines .....	1,275
Metals and metallic substances .....	1,060
Engraving and printing .....	768
Oleaginous substances .....	582
Water and other fluids, conducting and filtering .....	573
Building materials and processes .....	502
Telegraphs and signals .....	500
Dyeing and colouring .....	483
Motive power and propulsion .....	81
Miscellaneous .....	9,950
<b>Total .....</b>	<b>31,103</b>

#### POSTAL COMMUNICATION WITH FRANCE.

Under the provisions of a new postal convention recently concluded with France, on the 1st January, 1862, and thenceforward, patterns of merchandise (such patterns being in themselves of no intrinsic value), may be transmitted by post between the United Kingdom and France and Algeria under the same regulations that are applicable to, and at the same reduced rates of postage that are chargeable upon, printed papers.

#### Home Correspondence.

##### SMOKE—ITS USE TO PURIFY THE AIR.

SIR,—There is no less merit in the advocacy of a principle by Dr. Stenhouse because it is not a new discovery of his—a principle which I enunciated in the *Times* seven years ago; but when it is supported and sanctioned by so able an authority, it may interest many of your readers to learn how closely Dr. Stenhouse follows my views (pretty severely handled at the time), by comparing his letter, which appeared in No. 475 of the *Journal*, with mine in the *Times* of September 15th, 1854, and which I now append:—

“LONDON SMOKE—ITS USE TO PURIFY THE AIR.—Justice demands that the good qualities of smoke should now be shown. In an artistic view of it, smoke is undoubtedly a great evil, because it blackens our buildings, and casts shadows upon them where there should be light; nevertheless, smoke is not an unmitigated evil; in a sanitary or chemical point of view it is very beneficial, for it purifies the air when contaminated with the poisons of malaria. Smoke, in truth, is nothing more than minute flakes of carbon or charcoal. Carbon in this state is like so many atoms of sponge, ready to absorb any of the life-destroying gases with which it may come in contact. In all the busy haunts of men, or wherever men congregate together, the surrounding air is, to a certain extent, rendered pernicious by their excretions, from which invisible gaseous matter arises, such as phosphuretted and sulphuretted hydrogen, cyanogen, and ammoniacal compounds, well-known by their intolerable odour. Now, the blacks of smoke (that is, the carbon) absorb and retain these matters to a wonderful extent. Every hundred-weight of smoke probably absorbs 20 cwt. of the poisonous gases emanating from the sewers and from the various works where animal substances are under manipulation, by fell-mongers, for instance, fat-melters, bone-crushers, glue-makers, Prussian blue-makers, &c. This accounts for the fact that London, although the most smoky, is yet the healthiest metropolis in the world. In waging war, therefore, against smoke as an artistic evil, it is not wholly wise to dispense with it, on account of its sanitary value. Before we try to throw off the cloud-cap of London, we should shut off the sewers from all upward communication with the streets, embank the Thames, and, by an Act of Parliament, send the bone-crushers to Salisbury plain. As London is at present constituted, smoke is the very safeguard of the health of the population; it is unquestionably the mechanical purifier of a chemically-deteriorated atmosphere.—SERPENS PIESSE.”

While it will be seen how we agree as to the disinfecting properties of carbonaceous smoke, it is fair to say that the properties which Dr. Stenhouse attributes to green wood smoke, I attribute to other matters therein, rather than to the “divided charcoal,” namely to the pyro-ligneous acid vapour, the kreasote and other numerous analogous compounds, which are evolved when green wood, cutch, &c., are burned in the open air. Comparatively speaking, green wood gives out less carbonaceous smoke than fossil wood-coal.

It is true there are volumes of vapour, but this chiefly consists of steam and the antiseptic disinfectants mentioned, the presence of which may be distinguished by the smell borne by the air miles away from the source of production.

I note here the disagreement between the views of Dr. Stenhouse and myself, because I think it important that all the disinfecting agents at our command should be understood and employed when occasion arises.

The antiseptic properties of the vapours of all kinds of incense were practically appreciated by the ancients, and I am perfectly convinced they cannot be disregarded in our own day without a penalty for neglecting their proper use.

I am, &c.,

G. W. SEPTIMUS PIESSE.

Band-street, W., Dec. 30, 1861.

#### LONDON IMPROVEMENTS.

SIR,—Whilst perusing in the *Journal* the report on New Blackfriars-bridge, my memory was carried back to the reference made by our esteemed Chairman of the Council, in his opening address, to the decreased time it took to cross the United Kingdom (as compared with former times), without decrease in the time required to cross the metropolis, arising from the inability of our metropolitan thoroughfares to digest their increasing ordinary traffic. Any novel mechanical appliance for facilitating communication has thus far proved unavailable.

The growth of circumstances gives sufficient indication where improvement should commence. The abolition of Newgate market, the ruin in Paternoster-row, with a comparatively small outlay now, would give a northern view of St. Paul's. The Thames Embankment scheme, the Doctors' Commons improvements, the approaches to new Blackfriars-bridge, as well as railway works and station centralisation in this locality, all concur in giving a "now or never" opportunity to a comprehensive plan that would yield a southern and river as well as general view of St. Paul's, redeeming the buried grandeur of the noble structure from its present pent-up condition.

The great question that enters into all improvement schemes is that of cost, and appalling estimates are always formed of the supposed value of City property. Exclude, as of an exceptional character, the property in the front thoroughfares, and the group of buildings north or south of St. Paul's would be found of only equal value to any similar space in the metropolis; and let it be borne in mind that the greater part of the property north and south of St. Paul's must of necessity change its character, with, perhaps, the unfortunate result likely to be produced by individual will, the necessities of boundary or title, and a total disregard of any general plan of beauty or uniformity. From the northern side of St. Paul's, by the removal of buildings of a comparatively valueless character, a thoroughfare might be formed to intersect Farringdon-street about the centre, and, if carried through the site of existing courts and alleys, would reach the south side of Lincoln's-inn; this, with the removal of a small block of by no means costly property between Lincoln's-inn and Long-acre, would give a central direct thoroughfare from Hammersmith to Stratford—the western road to the eastern road. Ten or twenty years of national prosperity, with the action of individual interest, would alter the elevation of the structures in such a thoroughfare, to the creditable advancement of the metropolis. The cost, when compared with the result attained, any person inspecting the localities would deem comparatively trifling. Whether that cost should be defrayed from national, municipal, or metropolitan resources may be questioned, but I hope my communication may elicit the general opinion of the value of the result suggested. I may, however, be permitted to state, that during a thirteen years' residence and ratepaying in Manchester, with all reasonable prepossession of a Londoner in favour of everything "town-made," I did arrive at the conclusion that they did these things better there. Public opinion having settled the necessity for an enlarged Exchange, the enlargement was actually carried out, and improvement committees really effected improvements. If the rates were high we saw something for the money, and all this proceeded noiselessly, yet effectively, without any men in armour or Lord Mayor's show.

I am, &c.,

HENRY WEBBER.

1, Brewer-street, Golden-square,  
Dec. 30th, 1861.

#### RAILWAY TRAVELLING.

SIR,—Mr. Hawes has submitted a series of questions to the readers of the *Journal*, in order to elicit the result of their experience as regards railway travelling.

The subject in question is of great importance, and as I think it to be materially affected by individual peculiarities, I beg to mention some further points for observation, which seem to be necessary to such an inquiry.

First, the occupation of the individual recording his experience should be always mentioned, as, for instance, barristers (as Mr. Adams has well pointed out) will be likely to suffer more than clerks, whose work is routine, and both these will suffer more than men who are engaged out-of-doors, or who get daily muscular exercise. Hard-worked men will suffer more than light-worked men.

Again, it is of importance to know whether the railway journey forms part of the daily work, as in the case of commercial travellers, or if it is an additional exertion after and before a hard day's work. In the latter case, anxiety is felt during the journeys to get to the work and home again; in the former the journey is looked upon as a part of the day's work, and the mind rests satisfied because the time and fatigue are not wasted. Thus is explained the difference experienced by the barrister and railway director, as mentioned in your journal of the 13th inst., with regard to the effect of daily railway travelling.

A third point to be noted is, whether a daily anxiety to catch the train, and the anxiety to go by a particular train, are felt as a strain by the traveller. To some I believe this is an intense evil.

Lastly, if it be found that the effect of railway travelling is only manifested upon the hard or overworked or less robust, yet that will imply that it is a burden upon all, though successfully resisted by the robust, which if absent would render all capable of greater exertion in their daily business.

As an occasional railway traveller, I have experienced a similar effect to that produced on board ship, viz., a great diminution of action in the voluntary muscular fibre, the great agent in all the abdominal and digestive functions.

I am, &c.,

ALEXANDER WALLACE, M.D., M.R.C.P.

23, Bedford-place, London, Dec. 31, 1861.

SIR,—In your issue of the 27th inst., Mr. Hawes writes as follows:—

"Mr. Baker, in his paper on this subject, assumed that constant daily railway travelling produced injurious effects on the health of railway travellers. He also suggested that the injurious effect was less in second-class carriages than in the first-class, and less in third than in second."

There are two mistakes in this sentence. 1st. I did not "assume" but *knew* that many persons suffered from railway travelling, and naturally assumed only that others might likewise experience ill effects from the same cause. 2nd. The sentence of my paper in which first, second, and third class carriages are mentioned together, runs thus:—"The improvements which have been pointed out being requisite for first-class carriages, how much more must they be for second and third class." My experience certainly does not lead me to Mr. Adams's opinion, that moderate but regular vibration is more trying than violent though irregular jolting. I have arrived at the contrary conclusion.

Mr. Hawes asks for experience as to reading on railways. I have myself always made a practice of reading, with considerable difficulty while sitting, i.e. subject to continual shaking—with no inconvenience whatever whilst standing, i.e., the body being steady. In my case the back and eyes were relieved by one and the same expedient.

I am, &c.,

T. BAKER.

Westminster, 31st December, 1861.

## Proceedings of Institutions.

**CROYDON LITERARY AND SCIENTIFIC INSTITUTION.**—The last report, presented at the annual meeting held on Thursday, October 17th, 1861, George Price, Esq., in the chair, says that during the last few years the committee of this Institution have had the gratification of adopting one unvarying tone indicative of prosperity. The year just ended is no exception to this encouraging state of affairs. There is now suspended in the reading-room the first address of the Institution, issued in November, 1838. Twenty-three years have since elapsed and the Society has undergone considerable changes; from strength she has sunk to a feebleness approaching to a defunct state; and from prosperity to an adversity amounting almost to insolvency. In her earlier days will be found the only approach to the position of strength and activity now attained. Those who have given steady and continuous help to the Institution through these three and twenty years are to be numbered by units; most prominently amongst them is Dr. Edward Westfall—in 1838 as in 1861, the first and foremost supporter of this Institution. The gross income for the year has been £914 8s. 6½d., and there is a balance of £77 0s. ¾d. in the Treasurer's hands. Of this, the sum of £69 should be carried forward as being due to the ensuing year's expenditure for unexpired membership—really leaving but £8 as available balance. £40 was granted to the trustees of the Public Hall Fund for investment in shares; the sum of £34 9s. 10d. was expended for repairs, lobby and other fittings in the Hall; £155 9s. 5d. was paid for rental, rates, and taxes. The number of members enrolled during the year is:—

First quarter .....	823	Third quarter .....	822
Second quarter .....	823	Fourth quarter .....	657
Average per quarter.....781.			

The following tabular statement shows the quarterly average of members and non-members during the past four years:—

Members.	Income from		Non-Members.	Total.
	Members.			
	£ s. d.		£ s. d.	
1857-58 ... 505	253 15 6	60	313 15 6	
1858-59 ... 507	257 15 6	44	301 15 6	
1859-60 ... 611	303 6 6	37	340 6 6	
1860-61 ... 781	615 15 3	108	623 15 6	

During the past year 381 volumes have been added to the library; 146 were bought, at an expense of £12 1s. 10d. to the funds of the Institution, and 100 volumes were purchased with donations of money, amounting to £16 12s., given for the purpose; in addition to which, 135 volumes have been presented. The sum of £47 has been expended in the purchase and rebinding of books. During the nine months of active operation of the Institution, the number of volumes issued from the library stands as follows:—

	Vols.
October to December, 1860 .....	2,754
January to March, 1861 .....	2,591
April to June, 1861 .....	2,373

Total in nine months... 7,718

The committee have decided upon printing another catalogue, in which the classification of the books will be adopted, so that the selection of a work for perusal will be made with less difficulty than at present. The lecture season has been one of unusual success, occasionally the hall being full to overflowing. The following is the list of lectures for the past season:—The Misses Terry, entertainment; Waterhouse Hawkins, Esq., three lectures on "Extinct Animals;" W. Kidd, Esq., lecture on "Birds;" E. Wheeler, Esq., "The Induction Coil;" Orpheus Glee Union, musical entertainment; Dr. Daniel, "Queen Elizabeth," two lectures; B. Wells, Esq., musical entertainment; Miss Glyn, "Reading from Macbeth;" Basil Young, Esq., two entertainments; Robert Hunt, Esq.,

lecture, "Discoveries in Science;" R. Lidgate, Esq., "An Odd Character;" the Brousil Family, concert; George Grossmith, Esq., "Adam Bede;" Mr. and Madame Enderssohn, entertainment; S. C. Hall, Esq., "Authors of the Age;" C. Charles, Esq., "Comic Characterisation;" Quintett Union, &c., concert; and the conversazione. The following lectures were gratuitously given:—B. Waterhouse Hawkins, Esq., on "Extinct Animals," two lectures; J. Eastty, Esq., "Oratory and Orators;" Robert Hunt, Esq., "Water;" Harry Chester, Esq., "Address on Institutions, &c.;" J. Bennett, Esq., "On a Watch;" Rev. J. B. Owen, "Haunted Houses;" and Rev. R. Maguire, "Curran, his Life, &c." Throughout the season the average attendance in the hall was 557—on one occasion (at Mr. Basil Young's entertainment in April last) 950 were present, some few others being unable to gain admittance. The singing classes are still conducted with success under the direction of Mr. Budd, who devotes much of his time to the purpose. Mr. J. W. Hobbs has kindly taken the presidency of the Choral Society, and gives the benefit of his talent to promote the objects of the society. The debating society was carried on with spirit and success during the winter months, and has again resumed its functions. Through an address, bearing upon the examinations of the Society of Arts, kindly given by Harry Chester, Esq., in the hall, the committee secured the co-operation of several gentlemen of Croydon, who formed a Local Board of Examiners, with the object of promoting the examination of any members of the Institution who might desire to compete for the prizes and certificates offered by the Society of Arts. The committee did not expect any great result to come from the first examinations. One of the members, Mr. Richard Gaskin, obtained a second-class certificate in English History. The attendance at the reading-rooms has been:—

October to December, 1860 .....	2,174
January to March, 1861 .....	2,312
April to June, 1861 .....	2,379

Total in nine months... 6,865

Your committee have to regret the retirement of Mr. Edward Hughes, from assisting in the management. They were so impressed with the value of the services rendered by him at the different entertainments and lectures given to the members, that a testimonial has been presented to him. The Public Hall Fund has increased from £1,408 as reported last year, to £1,567 13s. 6d.

**HERTFORD LOCAL EXAMINATION BOARD.**—A public meeting was held at the Shire Hall, on Monday evening, Dec. 2nd, for the purpose of presenting the certificates of the Society of Arts, and the prizes of the Local Board, to the successful candidates. There was a numerous attendance of the inhabitants of the town and neighbourhood. The chair was taken by the Right Hon. Wm. Cowper, M.P.; and amongst those on the platform were the Hon. Henry Cowper; Sir Minto Farquhar, Bart., M.P.; R. Dimsdale, Esq.; the Mayor (J. J. Gripper, Esq.); the Hon. and Rev. Godolphin Hastings, the Rev. J. W. Blakesley, the Rev. C. Deedes, the Rev. E. G. Arnold, &c. The Hon. Secretary (Mr. I. Marchant, jun.) read the report of the Local Board:—

"Nine names were this year sent to the Honorary Secretary for the previous Examination—eight from Hertford and one from Stapleford. Two of these candidates had passed the previous and final Examinations last year, and obtained certificates of merit for the latter. On the 4th March last, the remaining seven submitted to the previous Examination. Of these, six passed satisfactorily, and therefore became eligible for the "pass," or testing Examination, which was commenced at the Literary Institution, on the 4th March last, and continued and concluded at the house of the secretary on the 14th of that month. Passes to the final Examinations were granted to five candidates. The final Examination of the Society of Arts was held at the Literary and Scientific Institution, on the 30th of April and the 2nd and 3rd of May. The answers were in due course submitted to the examiners of that Society, and the awards of

certificates were made. (These have already appeared in the *Journal*.) In accordance with the recommendation of the Council of the Society of Arts, that Local Boards should hold Annual Examinations of persons under sixteen years of age, and grant, on their own authority, certificates and prizes, the Hertford Board resolved that (in order to encourage to a systematic course of reading, such young persons in this district as might not feel themselves able to undergo the Examination of the Society of Arts) a rudimentary examination should be held of candidates under the age of sixteen years, not receiving instruction at a day-school, and that a fund be formed for providing prizes, to be distributed according to the judgment of the Board. The subjects for such rudimentary examination were—arithmetic, composition, dictation, geography, grammar, and handwriting. Ten names were sent for examination—Six from Hertford, two from Hertingfordbury, and two from Bengoe. The rudimentary examination was held on the 4th March last, at the Literary Institution, Hertford. One of the Hertford candidates did not present himself. Nine competed for the prizes on that occasion, and the Examiners awarded the 1st prize to William Francis Crawley, of Hertford, solicitor's clerk, aged thirteen; the 2nd to Henry Newland, of Hertford, errand-boy, aged fourteen years; and "honourable mention" to Henry Brown, of Bengoe, and Martin William Farrow, of George-street, Bengoe. The expenses of the Local Board have been £13 1s. 11d."

THE CHAIRMAN said they must all sympathise with those young men, who, having reached an age when they are emancipated from the control of teachers and the restrictions of school, had devoted their leisure hours to the prosecution of studies which would be useful to them in their several walks of life, and had had the courage to appear in a public competition for prizes and distinctions in which so many of them had been successful. Self-education without some kind of assistance—except in some rare instances of strength of will and indomitable application—must be a most inefficient and insufficient means of education. Education was not a matter which could be left in the hands of those who need it. The persons who most need education were sure to be most unaware of their want; and it had, from the earliest times, been a subject in which those persons who took any interest in the public welfare had thought it necessary to interfere; and not only had the primary schools been supported by private beneficence and public grants, and our grammar-schools founded and endowed by our wealthy and benevolent ancestors—but even those schools in which the highest classes of the country are educated, owed their origin to charitable endowments. If the wealthiest classes in the land were not ashamed to avail themselves of the benefits of these charitable endowments, surely the most independent young man living need not mind being indebted to the care, consideration, thoughtfulness, and skill of the Examiners of the Society of Arts. The Examinations were just the thing that was wanted to assist the self-education of that large class of persons of the working and middle ranks, who, having left school early, desire to employ their leisure in such a manner as would tend to improve their minds, and to make them more useful in the positions of life which they might occupy. He could wish that there were a larger number of young men competing for these distinctions than he found in the list before him. But they must recollect this is only the second year that these Examinations had been conducted there, and might therefore hope that there would be a greatly increased competition in the time to come. Those who had succeeded upon the present occasion would shortly receive the certificates it was his pleasing duty to present them, and which would be a token to themselves, and their friends, of their capacity, their industry, and their attainments. Those who had gone up for the Examination, and who had not succeeded, would at least have acquired the regard and respect of their friends for their perseverance, their ambition to excel, and their willingness to undergo trouble for the purpose of being instructed; and they would not have lost their time, for they would have exercised their minds, and acquired an amount of knowledge, and gone through a process of mental disci-

pline which would certainly be useful to them through their lives. But in future the list of candidates for these distinctions must be enlarged. There were many more young men than had yet appeared in these competitions, who were not insensible to the advantage and satisfaction of being accounted well-educated young men; and he was sure those persons would see that they cannot do a wiser thing for their own interest and pleasure, than to set steadily at work, study one branch of learning—devote their minds heartily and strenuously in that particular direction—get what assistance they could, and go in for the examination, determined to get a certificate in that branch. He would suggest that employers, when about to engage young men, should ask those who present themselves, "Have you competed for a certificate, and have you been successful? If so, show me your certificate." That would be a test not only of the capacity of a young man applying for a situation, but of his willingness to work, and of his powers of application. They need not be afraid that those young men who are endeavouring to educate themselves would be less attentive and careful in the ordinary routine of their work, because they are exercising their minds on higher and larger subjects. The chairman then presented the certificates of the Society of Arts, and the prizes of the Local Board, to the successful competitors. The Prizes of the Local Board were as follows:—1st prize, William Crawley, aged 13, solicitor's clerk; 2nd prize, Henry Newland, aged 14, errand-boy; Henry Brown and Martin William Farrow (the latter an apprentice at the *Hertford Mercury* office) were "honourably mentioned." Crawley, who had undergone no special preparation for the examination, had been trained as a private pupil of Mr. J. Hannum, the English Master at Christ's Hospital. Newland had been educated in the Green-coat School. — Sir MINTON FARQUHAR, Bart., M.P., proposed the following resolution:—

"That the examination scheme established in this town deserves the support of the friends of education generally, and particularly merits the attention of young men and women residing within the district of the Local Board."

which was seconded by the Rev. H. S. WARLEIGH. The Hon. HENRY COWPER proposed—

"That the success of the candidates who have just received certificates and prizes, is calculated to encourage others to follow their commendable example."

which was seconded by R. DIMSDALE, Esq. The Hon. and Rev. GODOLPHUS HASTINGS proposed a vote of thanks to the Honorary Secretary, Mr. Marchant, jun., for his services since the establishment of the Local Board. As Deputy-Chairman of that Board, he (Mr. Hastings) was sensible how much they were indebted to Mr. Marchant. It was through his exertions that the Local Board was first called into existence; and it was mainly through his energy that they had arrived at the present satisfactory results. Mr. Marchant's services had not only been gratuitous, but, as appeared from the balance-sheet, he had paid £7 out of his own pocket, as the Secretary of the Board. He did not think it could be the wish or intention of those interested in this scheme, that Mr. Marchant should bear the expense to which he had referred; and therefore he would suggest that they should not leave the room without subscribing sufficient funds to cover the deficiency of the past year. And, that Mr. Marchant might not be placed in this position another year, he thought some of them should put down their names for a small annual subscription.—The Rev. CHARLES DEEDES said he had great pleasure in seconding the resolution. He was sure they owed a very large debt of gratitude to Mr. Marchant, for the great trouble he had taken in connection with the Local Board. The resolution was carried unanimously. Mr. J. MARCHANT, jun., acknowledged the vote of thanks. A vote of thanks to the Chairman was proposed by the MAYOR (Mr. J. J. Gripper), and carried unanimously.

MANCHESTER MECHANICS' INSTITUTION.—On Friday evening, November 15th, after a social tea-party, a meeting

assembled in the lecture-room of the Mechanics' Institution, David-street,—William Fairbairn, Esq., in the chair,—in order to witness the presentation of the certificates and prizes gained by students of the Institution at the recent government and Society of Arts' examination. Among the gentlemen present were the Mayor of Manchester (Thos. Goadsby, Esq.), Alderman Curtis (the ex-mayor), T. Bazley, Esq., M.P., the Rev. Canon Richson, Prof. Newth, Dr. J. Watts, Alderman Pochin, Messrs. H. J. Leppoe, D. Chadwick, R. Rumney, J. Heywood.—The CHAIRMAN stated the object of the meeting; and while the students were taking positions near the chair, the members of the Tonic Sol-fa Choral Union sang a glee. During the evening the Choral Union sang other selections of music.—The SECRETARY, (Mr. Thos. Marshall), made a statement respecting the examinations, of which the following is an abstract:—"The results of the Society of Arts' examinations are more satisfactory than those of any previous year. The number of certificates gained is the same as in 1860, but their value ranges much higher, as the following statement will show:—Number of candidates at the Final Examination in 1860, 27; in 1861, 33. Number of papers worked in 1860, 42; in 1861, 49. Successful candidates in 1860, 21; in 1861, 25. First-class certificates in 1860, 2; in 1861, 5. Second-class certificates in 1860, 8; in 1861, 13. Third-class certificates in 1860, 21; in 1861, 13. The number of papers worked at this Institution on the last occasion exceeds that of any other in the United Kingdom, the Glasgow Mechanics' Institution only excepted; while the number of successful candidates is not surpassed by any excepting the Institution just named and the Leeds Young Men's Christian Association, where an excess of one over this Institution is recorded. Several Institutions, however, besides these just named, have surpassed ourselves in the number and value of the certificates gained in proportion to the number of successful candidates."—The CHAIRMAN, in the course of a few introductory remarks, said that with regard to science he had been a hard worker in scientific pursuits, and he knew pretty well what was necessary in order to apply natural science in a practical form, and to render it useful in the social relations of life. He could assure the students that what was necessary was not easily attained, and would not be attained without hard labour. His advice to the young members of the Institution was to work hard and spend little. That was the best way to get on in the world. He alluded with pleasure to the fact that many of the certificates were for excellence in book-keeping, and regretted that in respect to mechanical drawing the students were not so forward as they ought to be. He advised them to apply themselves assiduously and carefully to the acquisition of a knowledge of elementary geometry, in the first instance, then facility in mechanical drawing would follow much more easily.—The certificates and prizes were then distributed, and the three prizes, of the value of a guinea each, given by the president of the Institution (Oliver Heywood, Esq.), to the three students in the evening chemistry class who had gained Queen's prizes. The meeting was subsequently addressed by the Rev. Canon Richson, Messrs. Rumney, Pochin, Bazley, and Curtis; and the proceedings concluded with a vote of thanks to the chairman.—Mr. Thomas Marshall has given notice of his intention to resign his post as secretary of the Manchester Mechanics' Institution, having accepted an appointment in a mercantile house in Manchester. The Board of Directors have passed the following resolution:—"That this Board receives with regret the resignation of its secretary, Mr. Marshall, and would hereby record its high appreciation of the manner in which he has fulfilled the duties of his office, and its sincere desire that in the new line of duties he has adopted he may reap that reward which his talents, industry, and integrity so well deserve."

**RYDE LITERARY AND SCIENTIFIC INSTITUTION.**—The Committee have just purchased of the Ryde Book Institution, their select library, which is proposed to be incor-

porated with their present collection of books—together about 3,000 volumes, containing many works of a valuable character. The sum expended on the purchase and making suitable provision for their reception is about £100, towards this sum his late lamented Royal Highness the Prince Consort very kindly contributed £10—only a few days prior to his fatal illness. This Society had previously received evidence of his generous sympathy for works of an educational and useful nature, by having received from him the handsome donation of £25 when the Committee were seeking a more suitable building for the purposes of the Society.

### MEETINGS FOR THE ENSUING WEEK.

- MON.....Geologists' Association, 7. Professor Tennant, "On Limestones."  
British Architects, 8.  
Entomological, 8.  
Medical, 8½. "Clinical Discussion."  
TUES....Pathological, 8. Anniversary Meeting.  
Photographic, 8.  
Royal Inst., 3. Professor Tyndall, "On Light" (Juvenile Lectures).  
WED....Archæological, 8½.  
Geological, 8. 1. Prof. J. Morris, and Mr. G. E. Roberts, "On the Carboniferous Limestone and Yellow Sandstone of Farlow and Oretou, Clee Hills, Salop; with a Note on a New Species of Pterichthys, by Sir P. Egerton." 2. Mr. E. W. Binney, "On some Fossil Plants, showing structure, from the Lower Coal-field of Lancashire."  
Graphic, 8.  
Roy. Soc. Literature, 8½.  
Microscopical, 8.  
THURS....Antiquaries, 8½.  
Philological, 8.  
Royal, 8½.  
FRI.....Astronomical, 8.  
SAT.....Asiatic, 3.

### PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, December 20th, 1861.]

Dated 10th December, 1861.

3098. W. E. Newton, 66, Chancery-lane—Imp. in knapsacks. (A com.)  
3100. J. W. Agnew, Windsor-chambers, Great St. Helen's—A new and improved electro-voltaic pocket battery. (Partly a com.)

Dated 11th December, 1861.

3102. H. Tanner and W. Proctor, Bristol—Imp. in the method of applying manure to growing crops, and also in the machinery or apparatus to be employed for such purpose.  
3104. W. C. S. Percy, Manchester—Imp. in machinery for making bricks, tiles, pipes, and other articles formed of plastic materials.  
3108. W. H. Tooth, Rhodeswell-road, and W. Yates, jun., Parliament-street, Westminster—Imp. in the manufacture of iron and steel, and in the machinery, apparatus, or furnaces used therein, and for the production of gas to be employed in such manufacture.  
3110. J. Looming, North Holme Mill, Bradford—Imp. in looms for weaving.

[From Gazette, December 27th, 1861.]

Dated 16th August, 1861.

2043. J. Livesey, New Lenton, Nottinghamshire—A new textile fabric for embroidery trimmings, and other ornamental purposes, and machinery employed in making the fabric into trimmings.

Dated 29th October, 1861.

2705. E. Suckow and E. Habel, Manchester—Imp. in antifriction mechanism for receiving the end thrust of screw propeller and other rotating shafts.

Dated 22nd November, 1861.

2939. W. Evans, Commercial-road East—Imp. in obtaining motive power by machinery.

Dated 25th November, 1861.

2951. V. Pendred, jun., Kilkenny, Ireland—Imp. in the construction and materials of surface condensers.

Dated 26th November, 1861.

2967. J. Brown, 2, Ribchester-terrace, Bridge-road, Stratford—Imp. in fire bars and furnaces.

*Dated 30th November, 1861.*

3018. J. W. Gibson, Dublin—Imp. in ordnance applicable also to small arms.

*Dated 3rd December, 1861.*

3025. T. W. G. Treeby, 1, Westbourne-terrace-villas, Westbourne-square—Imp. in machines for boring holes in rocks and other hard substances.
3026. R. A. Rust, 34, Great Marlborough-street, Westminster—Imp. in the construction of the cases of pianofortes.
3029. J. Burrows, Wigan, and J. Dougan, Haigh, Lancashire—Certain imp. in winding or driving drums or pulleys.
3031. G. T. Bousfield, Loughborough-park, Brixton—An improved stopper for bottles, decanters, jars, and similar articles. (A com.)
3033. W. Duchemin, Charlotte-town, Prince Edward's Island—Imp. in blocks for hoisting.

*Dated 4th December, 1861.*

3035. W. E. Gedge, 11, Wellington-street, Strand—Imp. in the manufacture of nose bags and similar articles, and in apparatus connected with such manufacture. (A com.)
3037. T. Stead and W. Higham, Ashton-under-Lyne—Imp. in machinery or apparatus for spinning cotton or other fibrous materials.
3039. J. E. Boyd, Hither-green, Lewisham, Kent—Imp. in scythes, scythe handles, and apparatus for connecting the same.
3041. W. E. Newton, 66, Chancery-lane—Imp. in pumps. (A com.)
3043. W. H. Balmain, Saint Helen's, Lancashire—Imp. in the manufacture of potash and salts of potash.
3045. A. Pullan and W. Lake, New Cross, Surrey—Imp. in traction and other engines, and in wheels for traction engines and other carriages, and in giving motion to ploughs and other agricultural machines.

*Dated 5th December, 1861.*

3049. G. W. Robertson, Cannon-street—Imp. in machinery for cleaning rice and other grain.
3051. W. Dicks, Floore, Northamptonshire—Imp. in pumps.
3053. W. Busby, Newton-le-Willows, Lancashire—Imp. in ploughs.

*Dated 6th December, 1861.*

3057. A. Woodward, R. Woodward, and W. Woodward—Improved arrangements of compound steam engines.
3059. C. Craddock, 5A, Orchard-terrace, Kensington—An improved system or method of cutting out ladies' dresses.
3061. E. Collier, Aldershot—Imp. in coverings for the feet and legs.
3063. W. Smith, Kettering—Imp. in the construction of horse hoes.
3065. H. G. Schramm, 149, Rothenburgsort, Hamburg—Imp. in rotary engines and pumps. (Partly a com.)

*Dated 7th December, 1861.*

3069. R. Jolley, 47, St. John-street, Smithfield—An improved apparatus for heating, cooling, or drying, infusing, extracting, or absorbing vapours or gases for manufacturing, medical, or domestic purposes, and for preserving liquids and solids, alimentary or otherwise.
3071. D. May, Wood-street—An improved method of securing scarfs and similar articles to the neck.
3073. H. W. Bristow, Jermyn-street—Imp. in the manufacture or production of candles. (A com.)
3075. T. Mellodew, Oldham, C. W. Kesselmeier, Manchester, and J. Worrall, Salford—Imp. in dyeing and printing certain descriptions of woven fabrics.

*Dated 9th December, 1861.*

3081. M. A. F. Mennons, 39, Rue de l'Echiquier, Paris—Imp. in the production of relief designs on metallic surfaces for general printing, gaufering, and embossing purposes. (A com.)
3083. R. A. Brooman, 186, Fleet-street—Imp. in treating atmospheric air and other elastic fluids for motive power purposes, and in engines and apparatuses to be employed therewith. (A com.)
3085. S. W. Silver, Bishopsgate-street, and H. Pringle, King's-road, Chelsea—Imp. in shoes for horses and other quadrupeds.
3087. W. Clark, 53, Chancery-lane—Imp. in gloves. (A com.)

*Dated 10th December, 1861.*

3089. G. Tear, Liverpool—Imp. for facilitating the drying of wet or damaged cotton or wool or other similar fibrous material.
3091. H. Spencer, Rochdale—Imp. in machinery and apparatus for spinning and doubling cotton and other fibrous substances.
3093. J. A. J. Redier, 4, South-street, Finsbury—Some imp. in pocket watches.
3094. V. L. Dagzan, 4, South-street, Finsbury—Imp. in the method of paving roads and other places.
3095. G. C. Lock, Liverpool—Imp. in cinder sifters.
3097. W. E. Newton, 66, Chancery-lane—Imp. in breech-loading cannon. (A com.)
3099. D. Vogl, Sambrook-court, Basinghall-street—Imp. in garments for gentlemen and ladies' wear.

*Dated 11th December, 1861.*

3106. R. A. Brooman, 166, Fleet-street—A new or improved method of treating teazles or thistles to be used in the teasing of cloths and stuffs and otherwise. (A com.)

## INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

3190. O. C. Evans, Whitton, Twickenham—Imp. in sewing machines.—20th December, 1861.
3197. J. Redfern, Hanley, Staffordshire—Improved apparatus for raising the temperature of air in order to warm churches, conservatories, houses, and other buildings or places.—20th December, 1861.

## PATENTS SEALED.

*[From Gazette, December 27th, 1861.]*

- |   |                                      |
|---|--------------------------------------|
| <i>December 26th.</i>                                   | 1735. A. Priest and W. Wool-nough.   |
| 1853. J. W. Graham.                                     | 1756. T. J. Smith.                   |
| 1856. S. Middleton & J. Wright.                         | 1805. A. Elliott.                    |
| 1861. J. Dyer.  | 1822. M. Henry.                      |
| 1867. I. Bragg.   | 1833. J. Cole and J. Cole.           |
| 1869. W. Livesey.                                       | 1905. A. Wood.                       |
| 1872. F. Potts and R. Cox.                              | 2251. J. H. Johnson.                 |
| 1874. L. H. Spence.                                     | 2367. W. Tongue.                     |
| 1877. J. P. E. Paignon, J. M. Vaudaux, and G. Gagnière. | 2540. C. N. Kernot and M. D. Rucker. |
| 1893. J. F. Spencer.                                    | 2571. J. Dixon and R. Clayton.       |
| 1708. J. Hutson.  | 2707. F. Bennett.                    |
| 1718. T. Wilson.  | 2766. J. Archer.                     |

*[From Gazette, December 31st, 1861.]*

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| <i>December 31st.</i>            | 1743. J. German and G. N. Browne.         |
| 1679. J. G. Wilson.              | 1744. T. T. Chellingworth and J. Thurlow. |
| 1690. G. Davies.                 | 1752. T. Reeves.                          |
| 1694. J. Petrie.                 | 1792. C. D. Abel.                         |
| 1695. P. Spence.                 | 1840. W. E. Newton.                       |
| 1700. J. M. Gale and T. Kennedy. | 1874. F. Johnson and B. Hockin.           |
| 1709. O. Williams.               | 1904. H. J. Holland and W. Paynton.       |
| 1712. R. Lakin and J. Wain.      | 2254. W. E. Newton.                       |
| 1715. J. Dean.                   | 2774. E. Brooks.                          |
| 1725. C. Farrow.                 |   |
| 1741. C. Cochrane.               |   |

## PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

*[From Gazette, December 27th, 1861.]**December 24th.*

2953. M. A. F. Mennons.

*[From Gazette, December 31st, 1861.]*

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|-----------------------|----------------------------------|
| <i>December 31st.</i> | 25. R. Tempest and J. Tomlinson. |
| 2992. R. A. Brooman.  |                                  |

## LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietor's Name.	Address.
4422	Dec. 10.	Paper and Envelope in One...	{ Edward Fredk. Devenish	Manchester-street, Manchester-sq., W.
4423	" 12.	Rein Holder ...	{ Walshe ...	
4424	" 14.	A Breast Drawer ...	{ John Collins ...	
4425	" 16.	Chimney Damper for Register Grates ...	{ S. Powell ...	
4426	" 18.	Watch Protector ...	{ The Shot Iron Company ...	
4427	" 18.	{ A Pair of Trowsers, to be called the Arcanum ...	{ John White ...	69, West Nile-street, Glasgow.
			{ Alfred Webb Miles... ..	2, York-place East, Greenwich, S.E.
				73, Brook-street, Hanover-square, W.